REMARKS

By this Amendment, applicants have amended claim 1 to clarify that hair treatment compositions of the invention are water based compositions containing at least 20% by wt. water in the total composition (supported, for example, at page 6, lines 1-4).

As discussed in greater detail below, applicants believe this change (among many other factors also discussed below) clearly distinguishes the water based shampoo, conditioner, gel, mouse, shower gel, lotion and serum compositions (page 5, line 30 to page 6, line 1) from the hairspray composition of U.S. Patent No. 4,983,418 to Murphy et al. It also highlights to a core difference between the particles of our invention, which are designed to enhance deposition of benefit agent from such water-based compositions; and the clays of Murphy, which are dispersing agents designed to disperse gum into a hairspray composition.

Initially, applicants note that claims 1-5, 14 and 15 have been provisionally rejected on the ground of non-statutory obviousness-type double patenting over claims 5, 8, 12, 13 and 17-19 of co-pending U.S. Application No. 10/497,889.

In this regard, applicants submit a Terminal Disclaimer that terminally disclaims that portion of any claim granted on the subject application which might extend beyond the expiration of any patent which might issue on U.S. Serial No. 10/497,889.

In view of the terminal disclaimer, it is respectfully requested that the obviousness-type double patenting rejection be removed.

At page 3 of the Office Action, the Examiner has rejected claims 1-5, 7 and 9-16 under 35 USC §103(a) as allegedly unpatentable over U.S. Patent No. 4,983,418 to Murphy et al. (hereinafter, "Murphy").

Specifically, Murphy is said to disclose hair treatment compositions comprising a dispersion of (1) hectorite, (2) a preferred cationic quaternary surfactant (i.e., quaternium-18), and (3) a silicone elastomer. It is said that, since the conditioner of Murphy is applied to hair to maintain temporary styling, the conditioner can be removed by water rinse. The Examiner further states that these "composite particles" can be dispersed and the dispersion can be combined with other ingredients without first drying the "aqueous dispersion of particles". This rejection is respectfully traversed for reasons set forth below.

The subject invention, as amended, is directed to a water based hair treatment composition where water is at least 20% by wt. of composition.

The particles which are used in these water-based compositions are specifically designed to ensure that the benefit agent of (iii) will have good deposition from the rinse off products (Page 1, lines 15-19). More specifically, the idea is to form a kind of structure to entrap the benefit agent and enhance deposition (as shown by the examples). In order to form such a structure, it is thus required that a separate clay (component (i)) and a separate charged organic particle (component (ii)) have a charge

opposite to one another. The net result is thus two components which attract one another and are capable of forming a structure which in turn is capable of supplying (and thus aiding deposition of) benefit agent particle.

Finally, the aqueous dispersion which is added without need of drying is thought, as previously noted, to produce the structure and thus assure the deposition will occur.

The compositions of Murphy, by contrast, differ from our invention in at least the following three important ways:

1) They are spray compositions and not water based;
2) The dispersing agent for the silicone does not comprise a separate clay and separate charged organic with opposite neutralizing charges, but rather is a single particle which itself is a quaternary cation (i.e., is charged) and does not "entrap" benefit agent in the way our composite particles do;

Indeed, there would be no reason for Murphy to have made such structured particles since the Murphy invention is concerned with dispersion of silicone to form fine particles and not with deposition; and

3) There is no teaching as far as applicants can tell of an "aqueous dispersion" at page 8, lines 3-12; there is only the disclosure of a dispersing agent and silicone gum (whether or not they are dried prior to combining with other ingredients).

Applicants will discuss each point below. First, applicants wish to note however that, although the Examiner refers at page 4, line 4 of the Office Action to "composite particles"; and at page 4, line 5 to "aqueous dispersion of particles":

a) The particles are not the composite particles of our invention; and
b) As noted, there is no "aqueous dispersion" (and anyway, the "particles" are different).

Referring to point (1), please note that the compositions of Murphy are hairspray compositions. The reason this is a critical distinction from our water-based composition is because the issues that applicants address and how they go about solving them; and the issues and solutions which Murphy addresses are completely different. Thus, Murphy, would not be and is not interested in forming a composite particle structure for enclosing or enveloping a benefit agent because such composite structure would be useful only for enhancing deposition, not for dispersing of silicone. Murphy, by contrast, is interested only in such fine particle dispersion and, consequently, does not have the same "composite particles" as those of the invention.

This leads us directly to point (2). Specifically, the hydrohpobically-modified clay materials of Murphy (e.g., the quaternium 18-Bertonite component noted by the Examiner at page 3 of the Office Action) are simply not the same as the composite particles of the subject invention. As noted, the composite particles of the subject invention comprise, as separate components, a clay, charged organic molecule and benefit agent wherein the charge on the organic material is opposite to the net surface charge of the clay. As explained, this is believed to allow formation of a structure

(formed from interaction of opposite charges) which can entrap the benefit agent and acid in its deposition.

By contrast, the hydrophobically modified particles of Murphy are ionically charged particles. They would not be expected to "entrap" benefit agent and, indeed, this is not their design or purpose. Instead, it is for dispersion of silicone into fine particles. With regard to the clearly different structure, applicants enclose a page from website www.pesticideinfo.org which relates to quaternium-18 bentonite and identifies it as coming from chemical class of quaternary ammonium compounds. Applicants further enclose a page from Wikipedia which states that such quats are clearly positively charged polycationic ions. As such, it is clear that the modified clays clearly do not perform the same function and are compositionally distinct from the composite particles if the subject invention.

Finally, with regard to point (3), this relates to a distinction which applicants have previously inserted into the claims relating to how the composite particles are incorporated into the hair treatment compositions as an aqueous dispersion without being dried.

The particles of our invention, as noted, are clearly in the form of aqueous dispersion. With regard to the combination of silicon and modified clays, as noted in Murphy (described at column 8, lines 3-16 as noted by the Examiner), this seems to describe nothing more than possible pre-combination of dispersing agent (e.g., modified clay) and gum. There is nothing disclosing that this is an aqueous dispersion.

As previously indicated, the spray composition of Murphy is fundamentally different from the aqueous-based compositions of the invention.

In summary, the subject invention is fundamentally different from the Murphy patent at least for the following reasons:

1. It is aqueous-based rather than spray;
2. the composite particles are fundamentally different; and
3. there is no drying step subsequent to formation of particles in aqueous dispersion.

At page 4 of the Office Action, the Examiner has rejected claims 6, 18 and 19 under 35 USC §103 over Murphy further in view of U.S. Publication No. 2002/0034486 to Midha ("Midha").

Applicants believe that the Murphy reference is sufficiently different from the subject invention that the combination with Midha does nothing to remedy deficiencies of Murphy. That is, the claims rise and fall together. Accordingly, it is believed this rejection should be removed.

In view of the amendment of the claims and discussion above, including the submission of the terminal disclaimer, it is respectfully requested that the Examiner withdraw all rejections of the claims and that claims, as amended (i.e., 1-7, 9-16 and 18-19) be allowed.

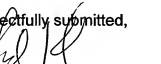
Finally applicants note that the corresponding European application was previously allowed and is currently in opposition.

In this regard, applicants added a Supplemental IDS enclosing pages 1-5 of "Facts and Submissions" recited by the Opposition Board after initial exchange of papers and references D1-D3 cited by opponent. Initially, the Board has agreed that none of the references are novelty destroying and is awaiting and proceedings before rendering opinion on inventive step. The D1-D3 references are:

1) U.S. Patent No. 5,846,549 to Beauquey et al.
2) WO 01/74311 (copy enclosed); and
3) U.S. Patent No. 4,983,377 to Murphy et al.

If a telephone conversation would be of assistance in advancing prosecution of the subject application, applicants' undersigned agent invites the Examiner to telephone him at the number provided.

Respectfully submitted,



Ronald A. Koatz
Registration No. 31,774
Attorney for Applicant(s)

RAK/pod
(201) 894-2912

Chemical Identification and Use for Quaternium-18 bentonite

Top

Basic Identification Information About This Chemical

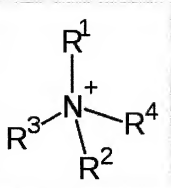
Chemical Name:	Quaternium-18 bentonite
CAS Number:	68953-58-2
U.S. EPA PC Code:	169111
CA DPR Chem Code:	2996
Molecular Weight:	0
Use Type:	Adjuvant
Chem Class:	Quaternary Ammonium Compound

View Related Chemicals

Quaternary ammonium cation

From Wikipedia, the free encyclopedia

Quaternary ammonium cations, also known as **quats**, are positively charged polyatomic ions of the structure NR_4^+ with R being alkyl groups. Unlike the ammonium ion (NH_4^+) and the primary, secondary, or tertiary ammonium cations, the quaternary ammonium cations are permanently charged, independent of the pH of their solution. Quaternary ammonium cations are synthesized by complete alkylation of ammonia or other amines. For possible synthesis route, see amines.



Quaternary ammonium cation. Any or all of the R groups may be the same or different alkyl groups. Also, any of the R groups may be connected.

Quaternary ammonium salts or **quaternary ammonium compounds** (called **quaternary amines** in oilfield parlance) are salts of quaternary ammonium cations with an anion. They are used as disinfectants, surfactants, fabric softeners, and as antistatic agents (e.g. in shampoo). In liquid fabric softeners, the chloride salts are often used. In dryer anticling strips, the sulfate salts are often used. This is also a common ingredient in many spermicidal jellies.

In organic chemistry, quaternary ammonium salts are used as phase transfer catalysts for reactions involving immiscible solvent systems, such as the synthesis of dichlorocarbene with chloroform and sodium hydroxide.

Contents

Synthesis

The synthesis of this cation from ammonia is referred to as **quaternization**.

Through exhaustive methylation, or the Hofmann Elimination process, a quaternary ammonium iodide salt is formed. The alpha-carbon (relative to the nitrogen) is deprotonated once by a hydroxide anion from H_2O and the electrons form an alkene. Subsequently, the electrons from the carbon-nitrogen bond are pushed onto the nitrogen. This sets up a tertiary amine as the leaving group.[1]

Large quaternary ammonium salts are typically obtained by alkylating tertiary amines. This process begins with a tertiary amine, to which is added a cationic alkyl group from an alkyl chloride. Typically one of the alkyl groups on the amine is larger than the rest.[2] The equation for this is:

$$RN(CH_3)_2 + ClR \rightarrow N(CH_3)_2R_2^+ + Cl^-$$

where R is the large alkyl group.

Antimicrobial use

Certain long alkyl chain quaternary ammonium compounds are used as antimicrobials and disinfectants. Examples are benzalkonium chloride, benzethonium chloride, methylbenzethonium chloride, cetalkonium chloride, cetylpyridinium chloride, cetrimonium, cetrimide, dofanium chloride, tetraethylammonium bromide, didecyldimethylammonium chloride and domiphen bromide. Also good against fungi, amoeba, and enveloped viruses,[3] quats act by disrupting the cell membrane and proteins. Quats kill just about everything except endospores, Mycobacterium tuberculosis, lipid-containing viruses, and Pseudomonas spp. (some Pseudomonas spp. can even grow in solutions of quats, subsisting on them).

In contrast to phenolics, quats are not very effective in the presence of organic compounds. Yet quats are very effective in combination with phenols. Quats are deactivated by soaps, other anionic detergents, and cotton fibers.[4] Also, they are not recommended to be used in hard water. Effective levels are at 200 ppm.[5] They are effective at temperatures up to 212°F.[6]

Along with sodium hypochlorite, quats are the primary chemicals used in foodservice industry as sanitizing agents.

Health effects

If inhaled or in contact with the skin, quats may cause skin and respiratory irritation.[7] They are proposed to be the responsible group for causing anaphylactic reactions to occur to neuromuscular blocking drugs during general anaesthesia in surgery.[8]

References

1. ^ www.organic-chemistry.org (http://www.organic-chemistry.org/)
2. ^ Kosswig, K (2002): "Surfactants" Ullmann's Encyclopedia of Industrial Chemistry
3. ^ *Specific Antimicrobials* (http://www.mansfield.ohio-state.edu/~sabedon/biol2032.htm), outline of lecture by Stephen T. Abedon, Ohio State U., URL accessed Dec 2008.
4. ^ *Specific Antimicrobials* (http://www.mansfield.ohio-state.edu/~sabedon/biol2032.htm), outline of lecture by Stephen T. Abedon, Ohio State U., URL accessed Dec 2008.
5. ^ *The Use of Disinfectants In the Swine Industry* (http://mark.asci.ncsu.edu/HealthyHogs/book1993/ladd1.htm), Mark G. Ladd, North Carolina State Univ., URL accessed Dec 2008.
6. ^ *Matching the Right Disinfectant to the Job* (http://www.infectioncontroltoday.com/articles/221clean.html), Michelle Gardner, URL accessed Dec 2008.
7. ^ http://www.ehjournal.net/content/pdf/1476-069x-8-11.pdf
8. ^ Harper, N. J. et al (2009): "Suspected anaphylactic reactions associated with anaesthesia", *Anaesthesia*, 64 (2):199-211

See also

- Choline
- Carnitine
- Benzalkonium chloride, benzethonium chloride, methylbenzethonium chloride, cetalkonium chloride, cetylpyridinium chloride, cetrimonium, cetrimide, dofanium chloride, tetraethylammonium bromide, and domiphen bromide; antimicrobial ingredients found in various over-the-counter products
- Denatonium; the most bitter compound known
- Cetyl trimethylammonium bromide (CTAB), stearalkonium chloride; cationic surfactants commonly used in toiletries
- Cocamidopropyl betaine (CAPB), a *very* common Zwitterionic surfactant used ubiquitously in toiletries
- Tetra-n-butylammonium bromide and Aliquat 336; common phase transfer catalysts
- Polyquaternium; designations for quaternary ammonium-containing polymers used for personal care products
- Paraquat; an herbicide
- Quaternary ammonium muscle relaxants

External links

- Toxicities of quaternary ammonium (http://www.inchem.org/documents/pims/chemical/pimg022.htm)